What is claimed is:

1. A projection optical system for projecting an image displayed on a predetermined display surface onto a predetermined projection surface comprising:

a front lens unit situated on the projection surface side;

a rear lens unit situated on the display surface side;

a first decentering lens unit situated between the front lens unit and the rear lens unit, movable in a direction vertical to an optical axis of the projection optical system;

a second decentering lens unit situated between the front lens unit and the rear lens unit, movable in a direction vertical to an optical axis of the projection optical system and substantially vertical to a direction where the first decentering lens unit is moved; and

a driving mechanism for reciprocating the first and second decentering lens units in directions vertical to the optical axis,

wherein the following conditions are fulfilled:

$$0.01 \leqq |FR/FD1| \leqq 0.2, \text{ and}$$

$$0.01 \leqq |FR/FD2| \leqq 0.2,$$

where FD1 represents a focal length of the first decentering lens unit, FD2 represents a focal length of the second decentering lens unit, and FR represents a focal length of the rear lens unit.

2. The projection optical system as claimed in claim 1, wherein the first decentering lens unit has positive optical power, and the second decentering lens unit has negative optical power.

3. The projection optical system as claimed in claim 2, wherein the first decentering lens unit is a plane-convex lens element, the second decentering lens unit is a plane-concave lens element, and curved surfaces thereof are opposed to each other.

4. The projection optical system as claimed in claim 1, further comprising an aperture stop situated between the front and rear lens units, and wherein the first and second decentering lens units are situated at the vicinity of the aperture stop.

5. The projection optical system as claimed in claim 1, wherein the projection optical system is a zoom optical system having a movable lens unit that is movable in a direction of the optical axis for zooming, the movable lens unit being included only in the front lens unit.

6. The projection optical system as claimed in claim 1, wherein the first and second decentering lens units are supported by lens frames, individually, and wherein the driving mechanism includes:

a supporter for supporting the lens frame so as to be rotatable; and

an actuator for rotating the lens flame about the supporter, disposed substantially on the opposite side of the supporter with respect to a center of the decentering lens unit.

7. The projection optical system as claimed in claim 1, wherein the first

and second lens units are supported by lens frames, individually, and wherein the driving mechanism includes:

a guide shaft for guiding a movement of the decentering lens unit, fitted in a through hole provided in the lens flame;

an actuator for linearly reciprocating the lens frame along the guide shaft, disposed on the opposite side of the guide shaft with respect to a center of the decentering lens unit.

8. The projection optical system as claimed in claim 1, wherein the first and second decentering lens units and the driving mechanism are integrated into a single optical unit.

9. A projection optical system for projecting an image displayed on a predetermined display surface onto a predetermined projection surface comprising:

a first decentering lens unit movable in a direction vertical to an optical axis of the projection optical system;

a second decentering lens unit movable in a direction vertical to an optical axis of the projection optical system and substantially vertical to a direction where the first lens is moved; and

a driving mechanism for reciprocating the first and second decentering lens units in directions vertical to the optical axis,

wherein a pair of the first and second decentering lens units is disposed on a most end part of the display side of the projection optical system and following conditions are fulfilled:

$$0.01 \leqq |LB/FD1| \leqq 0.2, \text{ and}$$

$$0.01 \leqq |LB/FD2| \leqq 0.2,$$

where FD1 represents a focal length of the first decentering lens unit, FD2 represents a focal length of the second decentering lens unit, and LB represents an air distance equivalent of a back focal distance of a part of the projection optical system except the first and second decentering lens units.

10. The projection optical system as claimed in claim 9, wherein the first decentering lens unit has positive optical power, and the second decentering lens unit has negative optical power.

11. The projection optical system as claimed in claim 10, wherein the first decentering lens unit is a plane-convex lens element, the second decentering lens unit is a plane-concave lens element, and curved surfaces thereof are opposed to each other.

12. The projection optical system as claimed in claim 9, wherein the projection optical system is a zoom optical system whose focal length is variable.

13. The projection optical system as claimed in claim 9, wherein the first and second decentering lens units are supported by lens frames, individually, and wherein the driving mechanism includes:

a supporter for supporting the lens frame so as to be rotatable; and

an actuator for rotating the lens flame about the supporter, disposed

substantially on the opposite side of the supporter with respect to a center of the decentering lens unit.

14. The projection optical system as claimed in claim 9, wherein the first and second lens units are supported by lens frames, individually, and wherein the driving mechanism includes:

a guide shaft for guiding a movement of the decentering lens unit, fitted in a through hole provided in the lens flame;

an actuator for linearly reciprocating the lens frame along the guide shaft, disposed on the opposite side of the guide shaft with respect to a center of the decentering lens unit.

15. The projection optical system as claimed in claim 9, wherein the first and second decentering lens units and the driving mechanism are integrated into a single optical unit.

16. An image projection apparatus comprising:

a projection optical system as claimed in claim 1 or claim 9; and

a light valve situated on the display surface for displaying an image, having a plurality of pixels arranged with a predetermined pitch, each pixel displaying one point of the image,

wherein the image displayed on pixels are changed according to a positions of the first and second decentering lens units.

17. The projection optical system as claimed in claim 16, wherein the first decentering lens unit has positive optical power, and the second

decentering lens unit has negative optical power.

18. The projection optical system as claimed in claim 17, wherein the first decentering lens unit is a plane-convex lens element, the second decentering lens unit is a plane-concave lens element, and curved surfaces thereof are opposed to each other.

19. The projection optical system as claimed in claim 16, wherein the projection optical system is a zoom optical system whose focal length is variable.

20. The image projection apparatus as claimed in claim 16, wherein the pixel of the light valve is projected onto the projection surface by the projection optical system as an image element, and wherein movements of the first and second decentering lens units cause an image shift of 0.3 to 1 times of an pitch of the image element in a projection image on the projection surface.

21. The image projection apparatus as claimed in claim 16, wherein a locus of an image shifting on the projection surface by movements of the first and second decentering lens units is a circle.

22. The image projection apparatus as claimed in claim 16, wherein a locus of an image shifting on the projection surface by movements of the first and second decentering lens units is a quadrangle.